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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/732,337	12/07/2000	Erdal Paksoy	TI-28759	1461

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EXAMINER	
TRAN, VINCENT V	

ART UNIT	PAPER NUMBER
2655	4

DATE MAILED: 01/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	09/732,337	PAKSOY ET AL.	
	Examiner	Art Unit	
	vincent v tran	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 December 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 December 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.

4) ☐ Interview Summary (PTO-413) Paper No(s). _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5, 8-11, 14-16 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drogo De Iacovo et al. (U.S. Patent No. 5,321,793) in view of Wuppermann et al. (U.S. Patent No. 5,808,569).

Referring to claim 1, Drogo De Iacovo et al. disclose a wide band signal coder comprising:

means for subdividing signals over a bandwidth into a lower subband and a higher subband signal (col.3, ln.67),

a downsampler (sampler, Fig.1, CMB) for downsampling the lower subband signals,

a low band speech coder (Fig.1, CDB, Audio coder for lower sub-band signals) coupled to the downsampler (sampler, Fig.1, CMB) for encoding lower sub-band signals, and

a combiner (Fig.1, decoder system) for combining said higher and lower sub-band signals (Fig.1, elements 12a, 12b and 13).

Drogo De Iacovo et al. do not specifically disclose a high-band coder for coding the higher subband signal without downsampling.

However, Wuppermann et al. teach a high-band coder (subband coder, Fig.1, element #64) for coding the sub-band signal without down-sampling.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to substitute the coder of Drogo De Iacovo et al. with the subband coder for coding the higher subband signal without downsampling in order to enhance the quality of reconstituted signal by deriving a further digitally coded signal from a further wider-band spectral portion of the input signal, as taught by Wuppermann et al. (col.1, ln.51-60).

Referring to claim 2, Drogo De Iacovo et al. further disclose the coder, wherein the combiner includes a bandpass filter (Fig.1, FQA2) coupled to the highband coder (Fig.1, DA) to bandpass the higher subband signal (Fig.1, 12a) to complement the lower subband (Fig.1, 12B).

Referring to claim 3, Drogo De Iacovo et al. further disclose the coder, wherein the combiner includes upsampling the encoded lower subband signals (interpolator, Fig.1, INB and col.4, ln.26-29).

Referring to claim 4, Drogo De Iacovo et al. further disclose the low band speech coder is a CELP coder (Fig.1, CDB and col.5, ln.36-39).

Refering to claim 5, Drogo De Iacovo et al. suggest the highband coder is an LPC coder (CELP coder CDA in col.5, In.36-39 necessarily includes 2 LPC coder).

Referring to claim 8, Drogo De Iacovo et al. disclose the coder, wherein the highband coder is gain-matched analysis by synthesis (CELP coder, col.3, In.38-40).

Referring to claim 9, Drogo De Iacovo et al. disclose the coder, wherein the highband coder is multi-pulse coding (Drogo De Iacovo et al. mention their multi-pulse subband coder in col.1, In.34-36).

Referring to claim 10, Drogo De Iacovo et al. disclose a speech coding system comprising:

means for subdividing signals over a bandwidth into a lower subband and a higher subband (col.3, In.67),

a downsampler (sampler, Fig.1, CMB) for downsampling the lower subband signals,

a low band speech coder (Fig.1, CDB, Audio coder for the lower subband) coupled to the downsampler for encoding the downsampled lower subband signals,

a first decoder for decoding the encoded lower subband signals (Fig.1, DB),

means for upsampling and lowpass filtering the lower subband signals to the same rate as the higher band signals (Fig.1, INB and col.4, In.26-29);

a bandpass filter (Fig.1, FQA1) coupled to a highband coder (Fig.1, CDA) to bandpass the higher subband signal to complement the lower subband Fig.1, 5A, 5B and 6);

a second decoder (Fig.1, DA) for decoding the higher subband signals and bandpass filtering (Fig.1, FQA2) the higher subband signals; and

an adder (Fig.1, ADDER) for summing the lower subband signals and the higher subband signals.

Drogo De Iacovo et al. do not specifically disclose a speech coding system for coding the higher subband signal without downsampling.

However, Wuppermann et al. teach a speech coding system (subband coder, Fig.1, element #64) for coding the sub-band signal without down-sampling.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to modify the system of Drogo De Iacovo et al. by having the subband coder for coding the higher subband signal without downsampling in order to enhance the quality of reconstituted signal by deriving a further digitally coded signal from a further wider-band spectral portion of the input signal, as taught by Wuppermann et al. (col.1, ln.51-60).

Referring to claim 11, Drogo De Iacovo et al. further disclose the low band coder is a CELP coder (Fig.1, CDB and col.5, ln.36-39).

Referring to claim 14, Drogo De Iacovo et al. disclose the system, wherein the highband decoder includes a gain-matched analysis by synthesis (CELP, col.3, ln.38-40) and the highband decoder includes a codebook with allowable excitation vectors (col.1, ln.34-36), a multiplier (Fig.3, MD1 and MD2) and an LPC filter (col.2, ln.5-8).

Referring to claim 15, Drogo De Iacovo et al. disclose the system, wherein the coder is a multi-pulse coder (Drogo De Iacovo et al. mention their multi-pulse coder in col.1, ln.34-36).

Drogon De Iacovo et al. do not specifically disclose, on the decoder or second decoder, a LPC synthesis filter for filtering a gain-scaled approximation waveform.

However, it would have been obvious to one having ordinary skill in the art at the time the invention to decode this standard CELP decoding technique for a multipulse coded CELP signal by inverting the coding operation in such a manner to simplify the decoding processing.

Referring to claim 16, Drogo De Iacovo et al. disclose a wideband speech decoder system comprising:

a first decoder for decoding encoded lower subband signals (Fig.1, DB);

a second highband decoder for decoding higher subband signals (Fig.1, DA);

a converter for converting said lower subband signals to the same sampling rate as the higher band signals (Fig.1, INB and col.4, ln.26-29); and

an adder for summing the lower subband signals and the higher subband signals (Fig.1, ADDER).

Drogo De Iacovo et al. do not specifically disclose a second highband decoder for decoding higher subband signals at a higher sampling rate than the lower subband signals.

However, Wuppermann et al. teach a highband decoder for decoding higher signals at a higher sampling rather than the lower subband signals (col.5, TABLE 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to modify the system of Drogo De Iacovo et al. by employing a subband coder for coding the higher subband signal at the higher sampling rate in order to enhance the quality of reconstituted signal, as taught by Wuppermann et al. (col.2, ln.30-34).

Referring to claims 19, Drogo De Iacovo et al. disclose the system, wherein the second decoder includes a gain-matched analysis by synthesis (CELP, col.3, ln.38-40) and the highband decoder includes a codebook with allowable excitation vectors (col.1, ln.34-36), a multiplier (Fig.3, MD1 and MD2) and an LPC filter (col.2, ln.5-8).

Referring to claim 20, Drogo De Iacovo et al. disclose the system, wherein the coder is a multi-pulse coder (Drogo De Iacovo et al. mention their multi-pulse coder in col.1, ln.34-36).

Drogon De Iacovo et al. do not specifically disclose, on the decoder or second decoder, a LPC synthesis filter for filtering a gain-scaled approximation waveform.

However, it would have been obvious to one having ordinary skill in the art at the time the invention to decode this standard CELP decoding technique for a multipulse coded CELP signal by inverting the coding operation in such a manner to simplify the decoding processing.

3. Claims 6-7, 12-13 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drogo De Iacovo et al. as applied in claims 1, 10 and 16, in view of Wuppermann et al. and further in view of Manjunath et al. (U.S. Pub. No.2002/0099548 A1).

Referring to claims 6 and 7, the combination of Drogo De Iacovo et al. with Wuppermann et al. does not specifically disclose a coder, wherein the highband coder is random noise or noise excited LPC.

However, Manjunath et al. teach noise excited linear prediction coding models the speech signal as a random noise sequence (paragraph [0328]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to substitute the coder of Drogo De Iacovo et al. with noise excited linear prediction coder in order to improve the quality of signal reproduction where the speech signal has little or no pitch structure as taught by Manjunath et al (paragraph [0328]).

Referring to claims 12-13 and 17-18, the combination of Drogo De lacovo et al. with Wuppermann et al. does not specifically disclose a highband decoder or second decoder is gain-scaled random noise or noise excited LPC and the output is applied to an LPC synthesis filter.

However, Manjunath et al. teach noise excited linear prediction coding models the speech signal as a random noise sequence (paragraph [0328]), and the output is apllied to an LPC synthesis filter (Fig. 22B and paragraph [0329]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to substitute the coder of Drogo De lacovo et al. with noise excited linear prediction coder in order to improve the quality of signal reproduction where the speech signal has little or no pitch structure as taught by Manjunath et al (paragraph [0328]).

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kidder et al. (U.S. Patent No. 6,182,031) teach an audio coding system, which encodes and decodes subband audio signals as a plurality of independent layers of coded audio data. Miseki et al. (US Patent No. 6167375) teach a method for low-rate speech coding and decoding. These two references are considered pertinent to the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner **Vincent V. Tran** whose E-mail address:

Vincent.tran@USPTO.GOV.

Phone number: (703) 305-1817

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Talivaldis Ivars Smits, can be reached on (703) 306-3011.

Any inquiry of a general natural or relating to the status of this application should be directed to the Technology Center 2600 receptionist whose telephone number is (703) 305-4700.

5. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

P.O. Box 1450

Alexandria, VA 22313-1450

Or faxed to: (703) 872-9314

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Dr, Arlington VA, Sixth Floor (Receptionist, Tel. No. 703-305-4700).

Art Unit 2655

VINCENT V. TRAN

Date: December 19, 2003

TĀLIVALDIS IVARS ŠMITS
PRIMARY EXAMINER